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New Nouveau
Brunswick

Natural Resources and Energy
Minerals, Policy and Planning

Mineral Resource Report

PRELIMINARY REVIEW OF NEW BRUNSWICK'S MINERAL INDUSTRY *2002*

Edited by
Barbara M.W. Carroll

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Mineral Resource Report 2003-1

Preliminary Review of New Brunswick's Mineral Industry *2002*

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Province of New Brunswick

Hon. Jeannot Volpé
Minister of Natural Resources and Energy

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SUMMARY

The preliminary value of New Brunswick's mineral production for 2002 is $652 284 987, a decrease of 19% from the final value of $807 202 968 for 2001. This was due mainly to the decrease in zinc production and a reduction in the price of zinc.

Metals accounted for 68% ($440 923 232) of the total value of production. Of these, zinc, lead, and copper made the largest contribution. Noranda Inc. operated the Brunswick No. 12 mine and Belledune smelter. During the year, seismic activity and production bottlenecks led to a reduced production rate. Operations continue to be suspended at the Caribou and Restigouche mines (Caribou Mine Division of CanZinco Ltd.), Mount Pleasant mine (ADEX Mining Corporation), and the Lake George antimony mine (APOCAN Inc.). Full site reclamation was completed at the Murray Brook mine (Murray Brook Resources Inc.), and the site continues to be monitored.

Nonmetallic minerals contributed 23% ($151 893 181) to the value of production. The main commodities are potash, peat, salt, and sulphur in smelter gas. The Potash Corporation of Saskatchewan Inc. (New Brunswick Division) mine near Sussex ceased production for 72 days for inventory adjustment. Five limestone and marl, and two silica quarries were active during the year. Twenty companies produced peat valued at $45 020 608 from 39 peatlands in New Brunswick.

Coal was valued at $22 088 000. N.B. Coal Limited has continued to reclaim lands disturbed by mining.

Structural materials such as lime, stone, and sand and gravel contributed about 6% ($37 380 574) to the value of production. Seven dimension stone quarries were active.

The focus of exploration in northern New Brunswick was base metals. No major companies were active in this area during 2002. However, a number of junior exploration companies explored a number of properties. More than half of exploration expenditures in the north were reported by Heron Mines Ltd. and joint-venture partner Aurogin Resources Ltd. Drilling and trenching programs were carried out on a number of properties.

Gold was the focus of exploration in southern New Brunswick, especially in the Clarence Stream and Marrtown areas. Most activity was related to the expansion of resources on known gold properties and the search for new gold occurrences in the southwestern part of the province. Diamond drilling and trenching programs were carried out.

Drilling and seismic surveys were carried out near the McCully natural gas field. Production from McCully 1 and 2 wells is planned for early 2003 by Potash Corporation of Saskatchewan Inc. (PCS) and Corridor Resources Inc. Oil production testing is being continued in the Hillsborough area by Columbia Natural Resources Canada Limited. The Province has proclaimed an *Act to Amend the Oil and Natural Gas Act.*

SOMMAIRE

La valeur de la production minérale du Nouveau-Brunswick de 2002 se chiffre à 652 284 987 $, ce qui représente une diminution de 19 % par rapport à la valeur finale de la production de 2001, qui avait atteint 807 202 968 $. Cette diminution résulte principalement d'une diminution dans la production de zinc et d'une baisse du prix de ce minéral.

Les métaux, principalement le zinc, le plomb, et le cuivre, ont représenté 68 % (440 923 232 $) de la valeur totale de la production. La Noranda Inc. a exploité la mine Brunswick nº 12 et sa fonderie Belledune. Pendant l'année, l'activité sismique et l'asphyxie de la production se sont traduites par un taux de production réduit. Les activités aux mines Caribou et Restigouche (Mine Caribou, filiale de la CanZinco Ltd.), à la mine du mont Pleasant (ADEX Mining Corporation) et à la mine d'antimoine du lac George (APOCAN Inc.) sont toujours suspendues. La remise en état complète du terrain à la mine de Murray Brook (Murray Brook Resources Inc.) a pris fin et le site fait toujours l'objet d'une surveillance.

Les minéraux non métalliques ont représenté 23 % (151 893 181 $) de la valeur totale de la production. Les principaux produits exploités sont la potasse, la tourbe, le sel et le soufre du gaz de four de fusion. La mine de la Potash Corporation of Saskatchewan Inc. (Division du Nouveau-Brunswick) près de Sussex a interrompu sa production pendant 72 jours pour un rajustement des stocks. Cinq carrières de calcaire et de marne, ainsi que deux de silice ont été en production pendant l'année. Vingt entreprises ont produit de la tourbe évalué à 45 020 608 $ à partir de 39 tourbières du Nouveau-Brunswick.

On estime la valeur de la production de charbon à 22 088 000 $. La N.B. Coal Limited a continué à restaurer les terres perturbées par l'extraction minière.

Les matériaux de construction comme la chaux, la pierre, le sable et le gravier, ont représenté environ 6 % (37 380 574 $) de la valeur totale de la production. Sept carrières de pierre de taille étaient en exploitation.

La prospection, dans le Nord du Nouveau-Brunswick, était centrée sur les métaux de base. Aucune entreprise importante n'était active dans cette région en 2002. Cependant, un certain nombre de petites sociétés d'exploration minière ont prospecté des concessions. Plus de la moitié des dépenses de prospection dans le Nord ont été signalées par Heron Mines Ltd. et son coentrepreneur Aurogin Resources Ltd. Des programmes de forage et d'excavation ont aussi été exécutés sur un certain nombre de concessions.

L'or a, pour sa part, constitué le point de mire des travaux de prospection réalisés dans le Sud du Nouveau-Brunswick, plus précisément dans les secteurs du ruisseau Clarence et de Marrtown. La majeure partie de l'activité a été reliée à l'expansion des ressources des concessions aurifères reconnues et à la recherche de nouvelles venues d'or dans le Sud-Ouest de la province. Des programmes de forage et d'excavation ont été exécutés.

Des relevés sismiques et de forage ont été effectués près du champ de gaz naturel de McCully. L'entrée en production des puits McCully 1 et 2 est prévue pour le début de 2003 par Potash Corporation of Saskatchewan Inc. (PCS) et Corridor Resources Inc. Columbia Natural Resources Canada Limited poursuit des essais de production de pétrole dans le secteur d'Hillsborough. L'Assemblée législative a aussi adopté la *Loi modifiant la Loi sur le pétrole et le gaz naturel*.

Chapter 1. Mineral Exploration

METALLIC MINERALS

Claims statistics collected by the New Brunswick Department of Natural Resources and Energy (Table 1) indicates that claim-staking activity was down by approximately 5% in 2002 and the number of claims in effect at year's end was down about 7.5%. Although the number of claims in effect in northern New Brunswick was slightly more than double (8839) that in the south (4326), the reverse is true for the number of claims recorded. In the south, 1349 claims were recorded compared to 769 in the north.

For all of New Brunwick, the actual exploration expenditure for 2001 was $9 400 000 (general and mine site exploration, including overhead) and the forecast for 2002 is $3 000 000 (Natural Resources Canada survey). Most of the expenditure was focussed on the base metals in the Bathurst Mining Camp in 2001 but with the inactivity of major companies in the Camp in 2002, slightly more than half of that year's expenditure was in the Camp. Expenditures increased slightly in the southern part of the Province.

The annual informal telephone poll for northern New Brunswick, taken by the New Brunswick Department of Natural Resources and Energy in October, indicates that exploration expenditures in the northern half of the Province for 2002 are approximately $500 000, down more than $4 500 000 from 2001.

Northern New Brunswick

No **major companies** were active in 2002 but CanZinco Ltd., Hudson Bay Exploration and Development Co. Limited, Noranda Inc., Phelps Dodge Corporation of Canada Ltd. and Teck Exploration Ltd. still hold land positions in northern New Brunswick. CanZinco holds 171 claims compared to 341 for 2001; Hudson Bay holds 33 claims compared to 198; Noranda holds 3111 claims compared to 3777; Phelps Dodge holds 36 claims compared to 96, and Teck holds 383 claims compared to 521 for last year.

In the latter part of 2001, *Noranda Inc.* finished drilling the Key Anacon property (Figure 1: 1), which was under option from Hunter Brook Holdings Limited. Noranda drilled 16 holes, totalling approximately 12 000 m, which represents the last exploration drilling the company did in the Bathurst Mining Camp before shutting down its Bridge Street office in Bathurst. The office was actually vacated in September, 2002, but not before turning over its digital and hardcopy exploration files to the Province under a two-year confidentiality agreement.

The active **junior companies** include Annapolis Valley Goldfields Incorporated, Aurogin Resources Ltd., Heron Mines Limited, Montoro Resources Inc., Nicon Holdings Ltd., Northeast Exploration Services Limited, Omni Mines Ltd. and PGE Resource Corporation. They collectively spent about $500 000. All but one of these companies received funding under the New Brunswick Junior Mining Assistance Program (NBJMAP). Other juniors, such as Chapleau Resources Limited, Corner Bay Silver Inc., Commander Resources Ltd. (formerly Major General Resources Limited), Eastmain Resources Inc., Freewest Resources Canada Inc., Mountain Lake Resources Inc., Royal Roads Corp. (formerly Kelmet Resources Ltd.), Stratabound Minerals Corp. and VenCan Gold Corporation held ground but did little or no work on their claims during the year.

Legend

1. Claims, Key Anacon Mine (Hunter Brook Holdings Limited)
2. Claims, Nigadoo North (Nicon Holdings Limited)
3. Claims, M & M Ext. (Miramichi Minerals Ltd.)
4. Claims, Belledune area (Heron Mines Ltd.)
5. Claims, Malachite (Log House Construction Ltd.)
6. Claims, Flatlands (Flatlands Limestone Ltd.)
7. Claims, Tower (Northeast Exploration Services Limited)
8. Claims, Simpsons Gulch–Boland Brook area (A.W. Lockhart)
9. Claims, Bills Lake (PGE Resource Corporation)
10. Claims, Clarence Stream area (Freewest Resources Canada Ltd. and others)
11. Claims, Birney Lake (Union Gold Inc.)
12. Claims, Waweig area (D. Stevens and K. Reeder)
13. Claims, Sheba (Pathfinder Resources Ltd.)
14. Claims, Springfield (M. Stewart)
15. Claims, Cape Spencer area (Pro-Max Resources Inc.)
16. Claims, Annidale area (PGE Resource Corporation)
17. Claims, New River (PGE Resource Corporation)
18. Claims, McKeel Lake (Annapolis Valley Goldfields Incorporated)
19. Claims, Sormany area (Elmtree Resources Ltd.)
20. Claims, Buckley Road (Graymont (N.B.) Inc.)
21. Peat Exploration Licence (Compagnie de Tourbe Fafard ltée)
22. Peat Exploration Licence (Sun Gro Horticulture Canada Ltd.)
23. Peat Exploration Licence (Premier Horticulture ltée)
24. Peat Lease (Jiffy Products (N.B.) Ltd.)

25a. Potash Corporation of Saskatchewan (New Brunswick Division) potash mine

25b. Oil and natural gas licence to search (Potash Corporation of Saskatchewan Inc.)

26. Bituminous shale licence to search (Three-D GeoConsultants Limited)
27. Underground storage exploration licence (St. Clair Pipelines (1996) Ltd.)
28. Underground storage exploration licence (Corridor Resources Inc.)
29. Underground storage exploration licences (Intragas Energy, LP)
30. Oil and natural gas licence to search (Jean Mariadassou)
31. Oil and natural gas licences to search (Corridor Resources Inc.)
32. Oil and natural gas licence to search (Corridor Resources Inc. and Potash Corporation of Saskatchewan Inc.)
33. Oil and natural gas licences to search (Columbia Natural Resources Canada, Ltd.)
34. Oil and natural gas licences to search (Corridor Resources Inc. and Columbia Natural Resources Canada, Ltd.)
35. Oil and natural gas licence to search (Norton Energy Inc.)
36. Oil and natural gas licence to search and leases (J.A. Seglund Inc.)
37. Oil and natural gas lease (RHT Enterprises Ltd.)
38. Oil and natural gas lease (Irving Oil Limited)
39. Oil and natural gas lease (Columbia Natural Resources Canada, Ltd.)

Figure 1. Highlighted exploration properties in New Brunswick, 2002.

Annapolis Valley Goldfields Incorporated optioned properties (Figure 1: 2–3) from Nicon Holdings Ltd. and Miramichi Minerals Ltd. Two holes were drilled on the former option to look for northern extensions of the high-silver Nigadoo lode, but without success. On the latter option, one or two holes will be drilled next year to test IP anomalies up-ice from known boulders that grade as high as 14% Pb + Zn and 14 oz./ton (480 g/t) Ag.

Heron Mines Ltd. and joint-venture partner *Aurogin Resources Ltd.* accounted for more than half of the exploration expenditures in northern New Brunswick. They worked their 370-claim property (Figure 1: 4) in the Belledune Inlier, specifically east of the Devonian Antinouri Lake Granite to evaluate the precious metal potential of its contact aureole, after finding a new auriferous zone at Guitard Brook in 2001. More than a dozen holes were drilled to test airborne (Aeroquest) geophysical anomalies from the survey that was flown in 2001. No results have been released to date.

Montoro Resources Inc. conducted a mapping and trenching program on its 37-claim cobalt property (Figure 1: 5), under option from *Log House Construction Ltd.* Assay results from grab samples, which were reported in 2001 and graded up to 2496 ppm Co, 495 ppm Cu and 5386 ppm As, attracted the company's attention to this property. The trenching showed that the host rocks are part of an intensely altered rhyolite flow that probably constitutes the base of the Lower Devonian Tobique Group.

Nicon Holdings Ltd. drilled 10 holes, totalling 356 m, on the 23-claim Flatlands property (Figure 1: 6) to delineate the extent of a limestone body that was discovered in 2001 by Reginald Wilson during routine bedrock mapping. Seven of the holes cut limestone, with the thickest intersection being 18 m. Assay results have not been reported.

Northeast Exploration Services Ltd. drilled two holes on its 22-claim Tower property (Figure 1: 7) to test a base-metal target along strike from the known zone that was drilled by Connecticut Development Ltd. several years ago. A well-developed footwall-type alteration zone was encountered but no significant sulphides were intersected.

Omni Mines Ltd. (W. Lockhart and associates) carried out additional work on its 654-claim property in the Simpsons Gulch–Boland Brook area (Figure 1: 8) in an attempt to source the nickel–cobalt stream-sediment anomalies that are common there. A single deep hole (about 1000 m) was drilled in 2001 to determine if there is a blind mafic intrusion in this area that could account for these anomalies and the coincident regional magnetic anomaly. However, the drilling did not show any increase in metamorphic grade with depth so the conundrum remains.

PGE Resource Corporation drilled one deep hole (over 1000 m) on its 98-claim Bills Lake property (Figure 1: 9) to test a base-metal target. No results have been reported.

Southern New Brunswick

Gold was the main focus of metallic mineral exploration activities in southern New Brunswick for the 2002 calendar year, especially in the Clarence Stream and Marrtown areas (Figure 1) east of St. Stephen and north of Sussex, respectively. Currently, several junior mining companies, local exploration companies and prospectors hold about 3000 claims in the Clarence Stream area and about 1000 claims in the Marrtown area. These companies and prospectors have spent in excess of $2 000 000 in these areas and on other claim groups elsewhere in the region in order to expand reserves around known gold deposits and search for new occurrences. Work during 2002 has confirmed that gold is widespread and occurs in a variety of settings throughout the

region, signifying the emergence of a new gold district.

Gold Exploration in the Clarence Stream area: *Freewest Resources Canada Inc.* led the exploration effort in the Clarence Stream area (Figure 1: 10) again this year, where it has been established that intrusion-related gold occurrences abound. Of major significance is the company's discovery of high-grade mineralization around "Anomaly A" that occurs a considerable distance (more than 3 km) northwest of initial discoveries in the vicinity of its Main Zone. The new mineralized zones occur in shallowly dipping, brittle fault structures in Ordovician strata in contrast to those in the Main Zone that are restricted to moderately to steeply dipping ductile–brittle deformation zones in Silurian volcanosedimentary sequences and mafic intrusions along the contact of Devonian felsic intrusions of the Saint George Batholith. To date, more than 150 holes have been drilled on Freewest's properties. The most recent drilling continued to intersect spectacular, potentially economic, high-grade ore zones within "Anomaly A." The company has also dramatically expanded the potential for these mineralized zones in the Ordovician strata over several kilometres by conducting extensive trenching programs in the vicinity of previously recognized occurrences along strike to the west. As a result of its work over the past few years, Freewest Resources Canada Inc. has commissioned a preliminary scoping study of the property. This is being initiated to assist in exploration efforts and to conduct a variety of projects (e.g., preliminary metallurgical work, economic analysis, etc.) aimed at future development of this gold resource.

Other junior mining companies involved in exploration in this area include Union Gold Inc., Fancamp Resources Ltd., Golden Hope Mines Limited, Murgor Resources Inc. and PGE Resource Corporation. Some of these companies conducted grassroots exploration activities on their properties with promising results. *Union Gold Inc.* drilled 5 holes following up on geophysical and geochemical surveys, and the discovery of high-grade auriferous boulders on the property (Figure 1: 11). Although no high-grade mineralization was intersected in the company's drilling program, they were successful in intersecting anomalous gold values within the mineralized structures directly along strike of those that host Freewest Resources Canada Inc.'s Main Zone deposit.

A group of local prospectors also continued to be very active in the area during 2002, including William Gardiner (Southfield Resources Ltd.), Emilio Doiron (Pro-Max Resources Inc.), Perry English, Raymond Thorn, David O'Neil, David Stevens, Peter Fenety, Kim Reeder and Karen MacKay. These explorationists conducted extensive grassroots exploration programs and demonstrated that potentially economic mineralized zones exist throughout this region of southwestern New Brunswick. Of particular note, *David Stevens* and *Kim Reeder* discovered additional high-grade gold mineralization at Waweig (Figure 1: 12), which appears to be associated with the same structural zone that hosts Freewest Resources Canada Inc.'s Main Zone, about 20 km along strike to the northeast.

Gold Exploration in the Marrtown area: In the latter part of 2002, *Emilio Doiron's* discovery of high-grade gold associated with steep fault zones within Ordovician mafic volcanic and intrusive rocks of the Ordovician Annidale Group resulted in intensive exploration north of Sussex (Figure 1). Junior mining companies, including Pathfinder Resources Ltd. and Serengeti Resources Inc., and several local exploration companies and prospectors including William Gardiner (Southfield Resources Ltd.), William Carter, Kevin Veysey, Charles Lowther and Cyril Beaman now hold nearly 1000 claims around and to the southwest of Marrtown. *Pathfinder Resources Ltd.*, who until recently held most of these claims, followed up on geophysical and geochemical programs by conducted a 14-hole drilling program (Figure 1: 13). Lower grades than expected were intersected at depth beneath the surface discovery zone. Several new mineral occurrences and indications of additional high-grade gold zones found on these properties may rejuvenate gold exploration throughout the Annidale Belt.

Gold exploration in other areas: Elsewhere in southern New Brunswick, intrusion-related gold systems are also being investigated. Of particular interest is the Springfield property (Figure 1: 14) held by *Merton Stewart* and located northwest of Fredericton. Mineralization on the property occurs in Silurian strata adjacent to Devonian felsic intrusions of the Pokiok Batholith in a similar setting to that at Clarence Stream. *TNR Resources Ltd.* drilled three holes on the property and were successful in extending the known strike length and depth of the auriferous altered zone but failed to intersect high-grade gold mineralization like that found previously on surface. However, they at depth and delineating a more extensive alteration zone than anticipated along strike. However, additional drilling is planned on the property in the near future.

In the Cape Spencer area south of Saint John (Figure 1: 15), additional grassroots exploration and a trenching program was conducted to further extend gold resources associated with the Hercynian fold–thrust belt in that area. *Emilio Doiron* (Pro-Max Resources Inc.), working in conjunction with *Raymond Thorn* and *Mark McNamara*, have discovered discrete and previously unrecognized, high-grade and potentially extensive gold-bearing zones on their advanced stage properties. Numerous drill-ready targets have been identified.

Exploration for other Commodities: *PGE Resource Corporation* continued exploration for massive sulphides in Ordovician and Silurian volcanosedimentary sequences in the Annidale and New River areas (Figure 1: 16–17) located northeast and west of Saint John, respectively. In addition to grassroots exploration in both areas, some drilling was conducted at New River with results pending.

Annapolis Valley Goldfields Incorporated drilled two holes on its McKeel Lake rare-earth-element property (Figure 1: 18) where mineralization was known to be associated with aplite dykes intruding alkali feldspar granite at surface. These dykes and others were intersected but grades were less than expected. However, potentially mineralized areas were delineated to the east of the drilled showing during reconnaissance mapping.

INDUSTRIAL MINERALS

During 2002, the focus of industrial mineral exploration was on limestone, dolomite and potash resources with activities reported in northern and southeastern New Brunswick. In the northern part of the province *Elmtree Resources Limited* continued to evaluate a dolomite deposit located a few kilometres east of its limestone operation at Sormany about 30-40 km west of Bathurst (Figure 1: 19). Elsewhere in northern New Brunswick, another limestone property near Flatlands underwent some mapping, sampling and a follow-up drilling program by *Flatlands Limestone Ltd.* (Figure 1: 6). In the southeast, *Graymont (NB) Inc.* renewed exploration activity on its Buckley Road limestone claims several kilometres north of its Havelock Processing facility (Figure 1: 20). Interest has also been shown in limestone and dolomite resources in the vicinity of Saint John, sparked in part by NB Power's refurbishment of the Coleson Cove Electric Power Generating Station.

Three Peat Exploration Licences were issued in eastern New Brunswick in 2002 (Figure 1: 21–23). *Jiffy Products (N.B.) Ltd.* maintained Peat Lease No. 32 as a reserve for future needs (Figure 1: 24).

Near Sussex, the *Potash Corporation of Saskatchewan (New Brunswick Division)* reported a five hole drilling project to be successful in intersecting a potentially significant potash resource adjacent to and southeast of its Plumweseep mine/mill facility (Figure 1: 25a).

HYDROCARBONS AND UNDERGROUND STORAGE

Oil and natural gas, underground storage and bituminous shale agreement areas are shown in Figure 1 (25b–39).

The McCully natural gas discovery near Sussex sparked drilling and seismic activity during 2002. A farmin by *EOG Resources Canada Inc.* saw three wells drilled near the McCully field (Figure 1: 31), while *Corridor Resources Inc.* initiated two reflective seismic programs to acquire some 120 km of seismic near McCully (Figure 1: 31) and Elgin (Figure 1: 34) . The Board of Commissioners of Public Utilities awarded a local gas producer's franchise to Potash Corporation of Saskatchewan Inc. and Corridor Resources Inc., along with permits to construct a pipeline and a gas processing plant. The companies have slated March 2003 as a target date for natural gas production from McCully 1 and 2 wells (Figure 1: 31). This represents the first indigenous natural gas production since suspension of production at the Stoney Creek field in 1991.

Columbia Natural Resources Canada Limited continued with oil production testing from two wells in the Hillsborough area (Figure 1: 36); however, the company reduced exploration activity mid-year as a result of a corporate decision.

The increase in petroleum exploration activity in the Province caused the New Brunswick Department of Natural Resources and Energy to undertake a two-phase review of its 1976 legislation. The outcome of the initial phase was proclaimed October 2001 in an *Act to Amend the Oil and Natural Gas Act*, and included amendments to the Survey System Regulation and Licence to Search and Lease Regulation. The second phase of the legislative review is underway and includes the development of a new drilling and production regulation, structuring of a royalty regulation and amendments to the geophysical exploration regulation.

STATISTICS

Federal

Mineral Exploration Expenditure Surveys for New Brunswick are carried out by Natural Resources Canada with assistance from the New Brunswick Department of Natural Resources and Energy (Mineral Information Services). The exploration expenditures are collected through two surveys each year. The Preliminary/Forecast in September followed by the Actual in January. Table 1 summarizes the results of the most recently available surveys.

Table 1. Summary of Mineral Exploration Expenditure Surveys

Form No.	Survey Name	No. Surveyed	General Exploration	Mine Site Exploration	Total*
Ex-1	Preliminary 2000	57	8 400 000	2 000 000	10 400 000
Ex-3	**Actual 2000**	**50**	**9 600 000**	**2 400 000**	**12 000 000**
Ex-1	Forecast 2001	57	7 700 000	2 500 000	10 200 000
Ex-1	Preliminary 2001	40	6 200 000	2 100 000	8 300 000
Ex-1	Forecast 2002	40	2 200 000	1 100 000	3 300 000

* Survey includes overhead expenditures. (Source: Natural Resources Canada)

Table 2. New Brunswick Mineral Resource Allocation and Exploration Statistics, 2001 and 2002

Mineral Resource Allocation (total in effect at year's end unless specified for the year)	2001		2002	
	Number	Hectares	Number	Hectares
Mining Act				
Prospecting Licences Issued (year)	61	---	91	---
Claims Recorded (year)	2 232	35 712	2118	33 888
Claims Expired (year)	3 288	52 608	3242	51 872
Claims in Effect	14 251	228 016	13 166	210 656
Coal Agreements	4	58 917.6	1	n/a
Potash Exploration Agreements	0	0	2	20 000
Potash Leases	2	20 024.2	2	20 024.2
Mining Leases	17	12 691	17	12 691
Total Agreements and Leases (above)	---	91 632.8	---	n/a
Total in Effect	---	319 648.8	---	n/a
Oil and Natural Gas Act				
Licences to Search	32	659 051.4	32	659 051.4
Leases	8	51 358.7	7	17 947.2
Bituminous Shale Act				
Licences to Search	1	26 833	0	0
Development Permits	0	0	0	0
Leases	0	0	0	0
Underground Storage Act				
Storage Exploration Licences	7	28 791	8	43 855.3
Storage Licences	0	0	0	0
Construction Permits	0	0	0	0
Quarriable Substances Act				
Quarry Permits	248	---	245	---
Quarry Leases	16	608.155	15	525.55
Peat Exploration Licences	3	1 002	3	1013
Peat Leases	36	14 433	36	15 133.8
Peat Options	11	3 580	8	2658

Exploration Summary	2001		2002	
	Work Reported	Value	Work Reported	Value
Mining Act				
Reports of Work (RW)	96 reports filed	$6 076 250.85+	76 reports filed	$4 895 245+†
Drilling Reported in RW	247 holes (60 131 m)	$4 333 701.06	211 holes (58 366 m)	$3 367 953
Potash Exploration	---	0	---	0
Oil and Natural Gas Act	8 wells (21 200 m*)	$24 860 808.00	2 wells (7200 m*)	$8 309 589†
Bituminous Shale Act	---	0	1 well (600 m*)	$254 900
Underground Storage Act	---	0	---	0

\+ includes expenditures from current and previous years
* licenced depth
† value at time of printing (final figure not available)
n/a not available

January , 2003

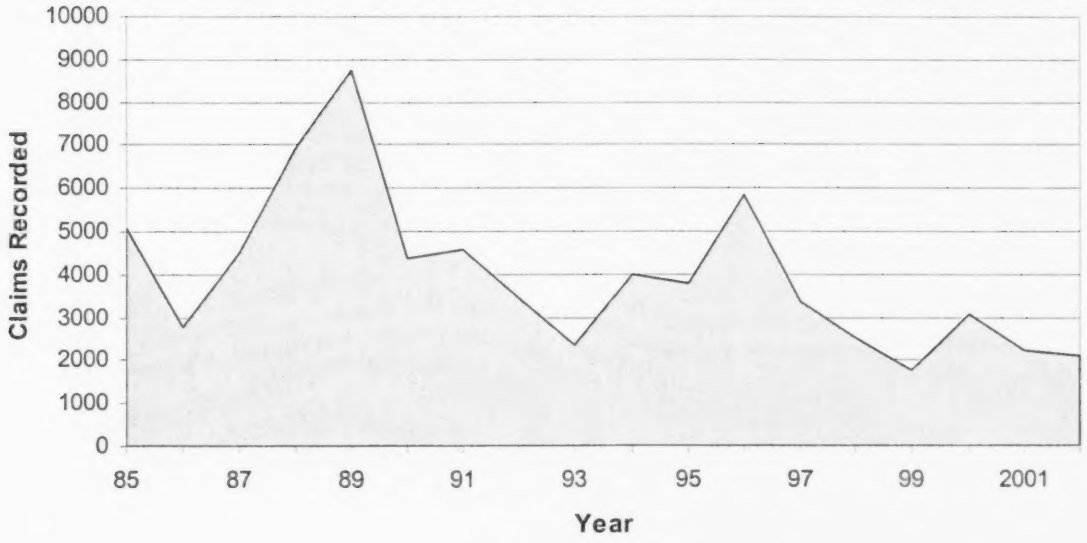

Figure 2. Mineral claims recorded, 1985–2002.

Provincial

The Recorder's office maintains an electronic claim tracking system that is updated as applications to record are received, as claims are renewed, transferred, regrouped or expire, and as reports of work are received (Table 2, Figure 2). Lease and licence documents and agreements issued under the various Acts are maintained and updated as required. Statistics (Table 2) indicate that overall claim-staking activity was down by approximately 7.5% in 2002.

PROVINCIAL EXPLORATION AND DEVELOPMENT INITIATIVES

The New Brunswick Prospector Assistance Program (NBPAP) is a two-tier financial assistance program that offers up to $10 000 [a maximum of $3000 under Tier 1 for grass-roots exploration plus a maximum of $7000 under Tier 2 for claim holders with advanced exploration projects] to valid New Brunswick prospectors and small exploration companies. The Tier 1 funding helps defray prospecting costs such as chemical analysis, mileage, meals and claim registration, while the Tier 2 funding is mainly for professional services from accredited contractors. The program provided $42 000 in Tier 1 funding to 23 applicants and $162 000 in Tier 1 and 2 funding to 24 applicants in 2002. The average value of the grants was $1830 and $6750, respectively.

The New Brunswick Junior Mining Assistance Program (NBJMAP) is an assistance program for junior mining companies. It provides financial assistance of 50% of exploration costs up to a maximum of $40 000 per project. Funding in the amount of $350 000 was allocated for 2002–2003 by the Province, through the Regional Development Corporation. Eleven applicants were approved for assistance. An advanced prospecting course was held in Bathurst during April, 2002. This comprised four consecutive weekend courses: Geophysics; Marketing/ Promotion/

Evaluation; Geochemistry; Origin of rocks, geological maps, and mineral deposits. Three introductory prospecting courses were held in September and October of 2002 in St. Andrews, Fredericton, and Moncton.

The Value-Added/Mineral Processing Program (VAMP), which was launched in 1996 in accordance with New Brunswick's Mineral Policy, is designed to provide funding on a shared basis for projects that could enhance the value of New Brunswick's minerals either by processing them to a higher level, or by improving the recovery of present products. In 2002, the program funded two studies.

Chapter 2. Mines and Quarries

PRODUCTION STATISTICS

The 2002 value of mineral production (including coal) in New Brunswick is estimated to be $652 284 987, representing a decrease of 19% from the final value of $807 202 968 in 2001 (Table 3; Figure 3). The decrease was due to a fall in production of zinc, as well as a marked reduction in the zinc price. The value of the Canadian dollar remained almost unchanged at US 64.03¢, down 1% from the previous year, when it averaged US 64.58¢.

The value of metals production during the year was $440 923 232, representing 68% of the Province's value of mineral production. Overall, the sector was down by 24%. Noranda's Brunswick mine, the Province's sole metals producer, experienced lower ore production than in 2001. CanZinco's Caribou mine remained shut down for the fourth full year after low metal prices and metallurgical difficulties had forced a suspension of operations in August 1998. Despite a weaker performance than in the previous year, zinc continued to dominate the metals sector, with a value of $313 683 092, representing 71% of the total value of metals. The value of zinc production decreased by approximately 29% from 2001. The zinc price fell by 12% between 2001 (40.2¢/lb. [U.S.]) and 2002 (35.3¢/lb. [U.S]). The slight drop in the average exchange rate of the Canadian dollar was not a significant contributor to the value of production as expressed in Canadian currency. Lead also was a factor in the drop in metals value, as production fell by 11%, while the price decreased by almost 5% (20.5¢/lb. [U.S.], down from 21.6¢/lb. [U.S.] in 2001). The value of copper production was almost unchanged at $22 115 646, as the price decreased by just over 1% (70.7¢/lb. in 2002 vs 71.6¢/lb. in 2001) and production decreased by less than 1%. Antimony, bismuth, and cadmium continued to be produced as by-products from the Brunswick operation. The total value of the three by-product metals decreased by 32%, mainly because of a substantial decline in bismuth production. Despite a 6% decline in the quantity of gold produced, the value actually increased by 8%, as a result of a 14% increase in the price. A 5% increase in the silver price was not enough to offset an 11% decrease in production, as the value of silver fell by 6%.

The nonmetals sector of the industry contributed $151 893 181 (23%) to the value of mineral production, a 10% drop from the revised 2001 value. The largest contributor to the value of nonmetals production is potash. Both the value and quantity of potash decreased from 2001 levels. In addition to the regularly scheduled twenty-eight day annual maintenance shutdown, the Potash Corporation of Saskatchewan's Penobsquis mine ceased production for a total of seventy-two days for inventory adjustment. Peat, the second largest contributor ($45 020 608) to the value of nonmetals production, represented 30% of the sector's value. The quantity and value of peat produced fell for the second consecutive year. Salt and sulphur in smelter gas ranked next in value of production, with quartz and marl being minor contributors to the nonmetals sector.

The value of coal produced by N.B. Coal Limited in the Minto–Chipman area increased by 11% to $22 088 000, as production rose by 18%.

The value of production for structural materials (lime, stone, sand and gravel) decreased 4% to $37 380 574. Sand and gravel productionwas down 2%, while stone production decreased by 5%. These commodities provide the raw materials for the construction industry in New Brunswick.

Table 3. Mineral Production in New Brunswick, 2001 (F) and 2002(P)
(Source: Natural Resources Canada)

Commodity	Unit	2001 Final		2002 Preliminary	
		Quantity	Value ($)	Quantity	Value ($)
Metals					
Antimony	kg	*	*	*	*
Bismuth	kg	251 530	3 102 119	189 333	1 905 258
Cadmium	kg	191 967	145 895	128 000	113 536
Copper	kg	9 047 821	22 610 505	8 993 756	22 115 646
Gold	g	*	*	*	*
Lead	kg	82 368 384	59 964 184	73 250 213	52 300 652
Silver	kg	224 956	49 435 490	199 156	46 589 161
Zinc	kg	313 088 879	441 142 231	256 696 475	313 683 092
TOTAL			580 228 349		440 923 232
Nonmetals					
Marl	t	*	*	*	*
Peat	t	488 619	53 765 688	411 575	45 020 608
Potash	t	*	*	*	*
Quartz (silica)	t	*	*	*	*
Salt	t	*	*	*	*
Sulphur (in smelter gas)	t	97 031	4 302 355	69 302	4 258 775
TOTAL			168 088 432		151 893 181
Fuels					
Coal	t	165 000	19 923 400	194 000	22 088 000
TOTAL			19 923 400		22 088 000
Structural Materials					
Lime	t	*	*	*	*
Sand and Gravel	t	2 529 230	*	2 540 266	*
Stone	t	4 203 659	20 072 809	3 177 687	19 074 460
TOTAL			38 962 787		37 380 574
GRAND TOTAL (CDN)			$ 807 202 968		$ 652 284 987

* confidential information GRAND TOTAL 2000 (CDN $) $772 546 475 **March, 2003**

METALLIC MINERALS

Operating Mines

Noranda Inc. – Brunswick Mine After a successful year operationally in 2001, when the company achieved record fourth quarter production of metals, Brunswick Mine in 2002 experienced more challenges in the mining operations. Seismic activity and production bottlenecks led to a reduction in the production rate from 9 900 t/d to 9 600 t/d.

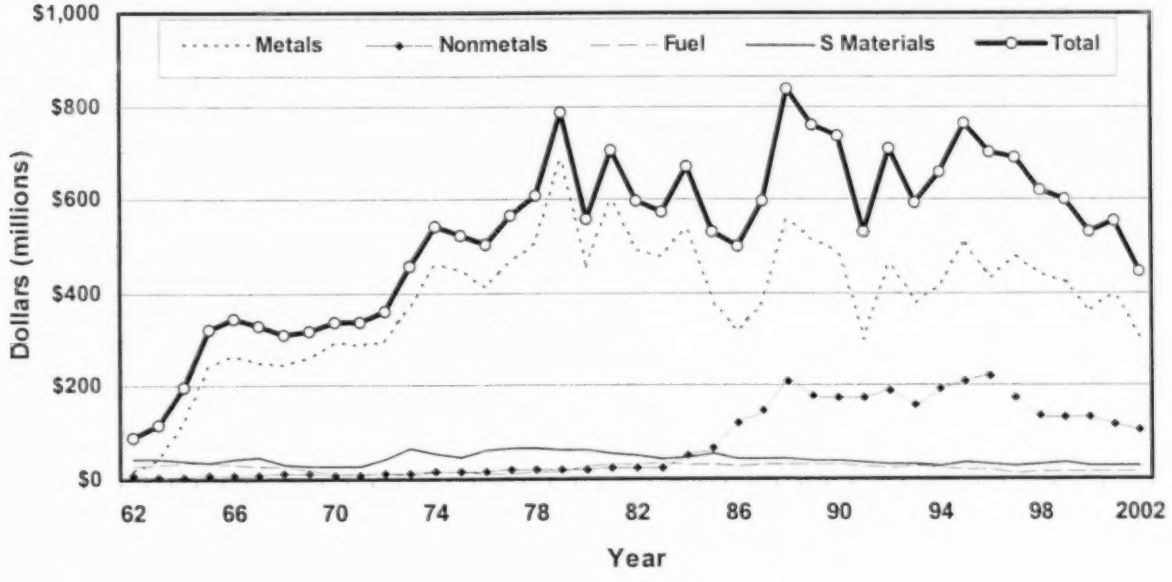

Figure 3. Value of mineral production in New Brunswick, 1961–2002. Source: Natual Resources Canada (1986 = 100).

Zinc accounts for approximately 71% of the value of Brunswick's production. Lead, copper and silver represent most of the remaining 29%. Both mine and smelter (Figure 4: 1a and 1b) ran largely uninterrupted throughout the year. Overall mine employment declined from an average of 965 in 2001 to 908 in 2002. This figure comprised 801 regular staff and 107 contract employees. The company is expected to continue reducing employment levels in accordance with operational needs as older employees retire.

Suspended Operations

In 1997, *ADEX Mining Corporation* received a consultant's feasibility study for the development of the Mount Pleasant tin–indium–zinc–bismuth–tungsten deposit (Figure 4: 2). The conclusions were disappointing, as the estimated capital costs were too high to justify a production decision at that time. The property remains under care and maintenance.

APOCAN Inc. operations remain suspended at the Lake George antimony mine (Figure 4: 3). Problems with the hoisting system, as well as a slumping antimony price, forced a temporary shutdown in December 1996. Despite hopes that the price would recover sufficiently to allow a resumption of operations, high metals inventories in global markets continue to depress the price and in 2002 the mine was still under care and maintenance.

Caribou Mine Division of CanZinco Ltd., a wholly owned subsidiary of Breakwater Resources Ltd. commenced production from its two properties (Figure 4: 4a and 4b) in mid-1997, with the first ore going through the mill in July.

As part of the 1997 operating plan, the Caribou concentrator was extensively modified and expanded. It was redesigned to produce separate zinc and lead concentrates, rather than a bulk

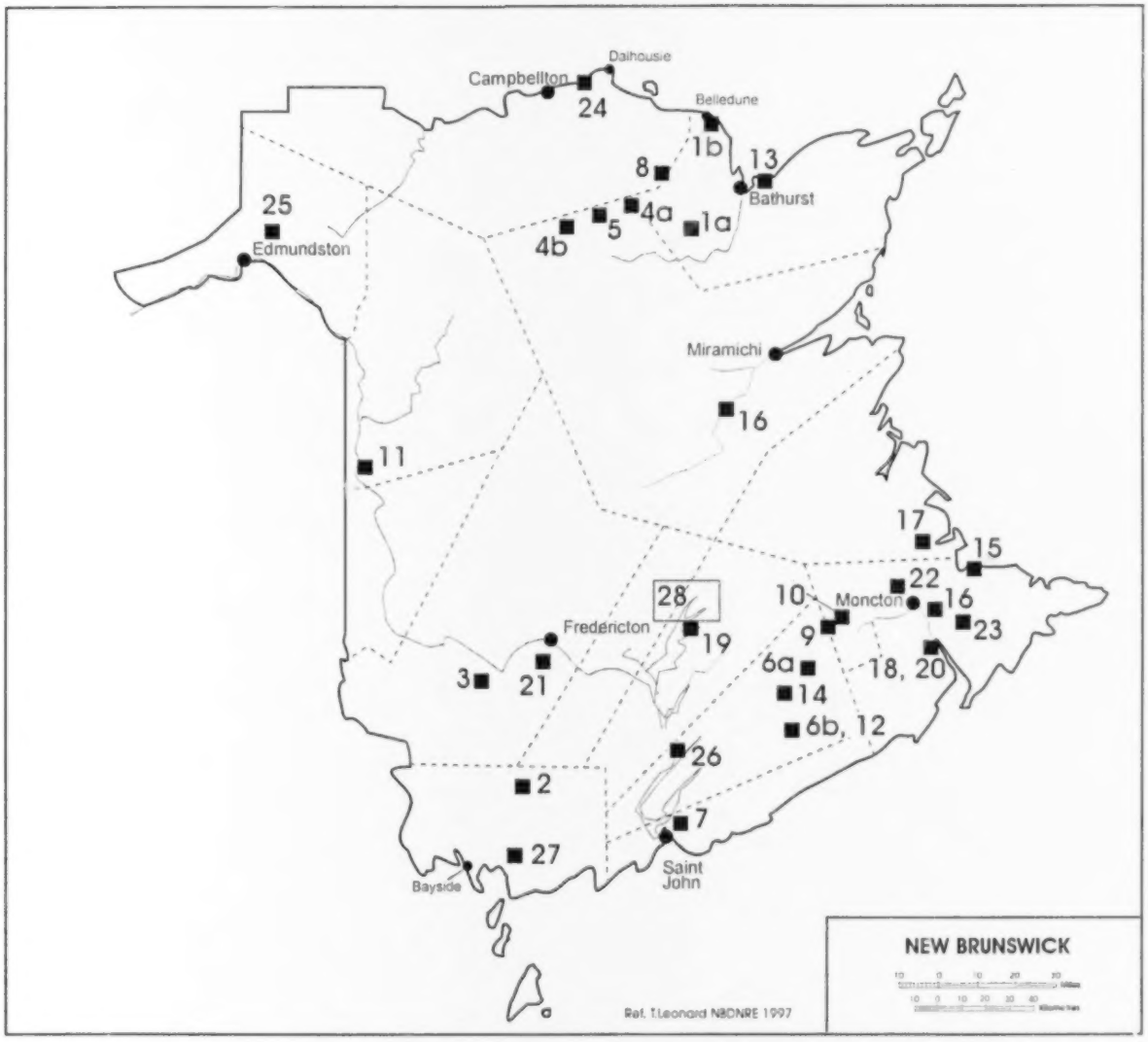

Figure 4. Mines and quarries in New Brunswick, 2002. See Figure 5 for peat producers.

1a. Brunswick No. 12 mine (Noranda Inc.–Brunswick Mine); Zn, Pb, Cu, Ag
1b. Belledune smelter (Noranda Inc.–Smelter)
2. Mount Pleasant deposit (ADEX Mining Corporation); Sn, In, Zn, Bi, W
3. Lake George mine (APOCAN Inc.); Sb
4a. Caribou mine (Caribou Mine Division of CanZinco Ltd.); Zn, Pb
4b. Restigouche mine (Caribou Mine Division of CanZinco Ltd.); Zn, Pb, Ag, Cu
5. Murray Brook mine (Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Inc.)); Au, Ag, Cu
6a. Potash Corporation of Saskatchewan Inc. (New Brunswick Division); potash, salt
6b. Potash Corporation of Saskatchewan Inc. (Cassidy Lake Division); processing facility
7. Brookville Manufacturing Ltd.; limestone, dolomite
8. Elmtree Resources Ltd.; limestone
9. Graymont (NB) Inc.; limestone
10. Lafarge North America Inc.; limestone

concentrate as had been the case in 1990, when it last operated. Surface preparation of the Restigouche open pit (Figure 4: 4b) began in the fall of 1996. The first ore was produced in the spring of 1997. All ore from the Restigouche site was trucked to the Caribou mine site for processing.

Operations were suspended in September 1998 because of low metal prices and difficulties in achieving target mill recoveries. The company has periodically updated its operating plan with a view to reopening when metal prices have improved sufficiently.

Closures

Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Inc.) Under the impact of a substantially lower copper price, the company decided in 1998 not to proceed with further mining at Murray Brook (Figure 4: 5), despite some initially encouraging results from exploration drilling at the mine site. Full site reclamation was completed according to an approved plan in September 2000. The site continues to be monitored for any possible environmental effects.

INDUSTRIAL MINERALS

Peat

Preliminary figures compiled by New Brunswick's Department of Natural Resources and Energy (DNRE) staff indicate that peat shipments in 2002 totalled about 13 000 000 standard bales with inventories standing at 3 000 000 bales early in the summer. About 15% of the production is shipped in a value-added form.

Figure 4 concluded

11. Upper Kent Lime Works Ltd.; marl
12. Atlantic Silica Inc.; silica
13. Chaleur Silica Ltd. (a Division of the Shaw Group); silica
14. Nelson Monuments Ltd.; dimension stone
15. Smith Cut Stone and Quarries Limited; dimension stone
16. Maritime Stone Works Inc.; dimension stone
17. Bastarache Stone Quarrie; dimension stone
18. T.P. Downey & Sons; dimension stone
19. Grand Lake Flagstone; dimension stone
20. Brunswick Limestone; dimension stone
21. Diamond Construction Limited; crushed stone
22. Moncton Crushed Stone, a Division of Modern Construction Ltd.; crushed stone
23. Acadia Crushed Stone Division of Modern Construction Ltd.; MacDonald Paving and Construction Limited; crushed stone
24. C.M. Stewart Company Limited; crushed stone
25. Clarence Daigle et Fils Ltée; crushed stone
26. Lafarge Construction Materials; sand and gravel
27. Jamer Materials Ltd.; sand
28. N.B. Coal Limited; coal

Twenty companies were producing from 39 peatlands (Figure 5) for a total area in production of 4200 ha. Most of the peat operations are located on Crown lands in the northeastern part of the Province. Six operations are located entirely on private lands. The f.o.b. value of shipments in 2002 is estimated to reach $ 100 000 000 (DNRE figures). Most of the production is sold in the USA (60 %) with Japan being the second largest foreign export market (15 %). Direct revenue to the Province in the form of royalties is expected to exceed $ 800 000 in 2002. During peak production, approximately 1100 people (including seasonal workers) were employed by the peat industry.

One company, *Jiffy Products (N.B.) Ltd.*, manufactures peat pots and peat pellets at its plant located in Shippagan, Gloucester County. Seven primary peat producers also manufacture peat-based products, mainly growing mixes, for the professional horticultural industry.

Potash

Reported production from the *Potash Corporation of Saskatchewan Inc. (New Brunswick Division)* mine near Sussex (Figure 4: 6a and b) was 599 000 tonnes in 2002, down slightly from 2001, a consequence of aggressive competition in offshore markets that resulted in lost sales and lower prices. This situation is anticipated to be temporary and should improve in 2003.

Natural gas-related exploration in the region has lead to the discovery of a potentially significant new high-grade potash zone adjacent to the existing PCS(NB) mine. Company officials are presently considering future development options for this resource.

Figure 5, legend

1. ASB Greenworld Ltd.
2. Beausejour Peat Moss Inc.
3. Compagnie de Tourbe Fafard ltée : (a) Shippagan; (b) Inkerman; (c) Évangéline; (d) Burnt Church; (e) and (f) Birch Ridge; (g) Stonehaven
4. Good Earth Canada Ltd.
5. Gardenscape of Canada Limited
6. Heveco Ltd.: (a) Tabusintac; (b) Brantville
7. La Mousse Acadienne (1979) ltée: (a) and (b) Coteau Road; (c) St. Margarets; (d) Eel River
8. La Tourbe de Pigeon Hill ltée
9. La Tourbière de Petit-Shippagan
10. La Tourbière du Centre de l'Île ltée
11. Le Groupe Berger ltée : (a) St-Camille; (b) Bay du Vin; (c) Bois-Francs; (d) Eel River Bridge
12. Le Groupe-Qualité Lamèque ltée : (a) and (b) Lamèque; (c) Saint-Raphaël; (d) Rivière-du-Portage; (e) Pokesudie
13. Malpec Peat Moss Ltd.
14. Premier Horticulture ltée : (a) Rogersville; (b) Black Brook; (c) Manuels; (d) Lake Stream Lake
15. Sun Gro Horticulture Canada Ltd.: (a) Lamèque; (b) Maisonnette
16. Theriault & Hachey Peat Moss Ltd. : (a) and (b) Eel River Bridge
17. Tourbière 2000 inc.
18. Tourbière du Grand-Lac ltée
19. Tourbière L. M. ltée
20. Tourbière Tracadie ltée

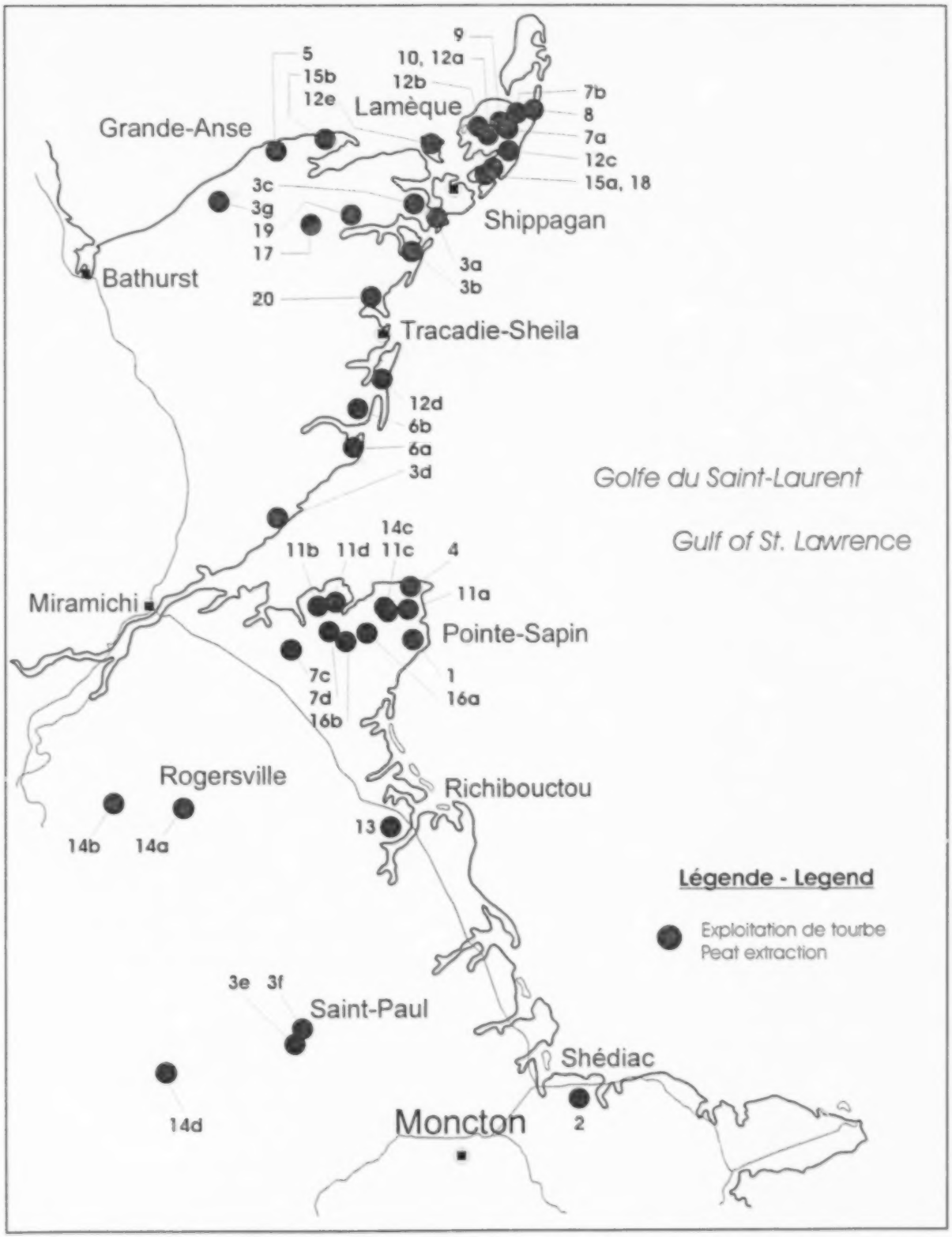

Figure 5. The peat industry of New Brunswick, Canada - 2003 / L'industrie de la tourbe au Nouveau-Brunswick, Canada - 2003.

Limestone, Dolomite, Marl

The Province's limestone, dolomite and marl operations (Figure 4: 7–11) continued to supply a host of products to domestic agricultural and minaufacturing sectors. Several exploration programs were completed in southeastern and northern New Brunswick. They evaluated potential high-grade limestone and dolomite resources.

Silica

The two silica operations in New Brunswick are *AtlanticSilica Inc.* and *Chaleur Silica (a Division of The Shaw Group* (Figure 4: 12, 13)

Natural Stone

The quarrying and working of stone for various applications continued its modest revival. Although there are several companies supplying stone products in the province, only a few actually quarry and process local stone. Both granite and sandstone are worked on demand (Figure 4: 14–20).

A notable development in this sector in 2002 was the acquisition of a former sandstone quarry site south of Marimichi City in north-central New Brunswick (Figure 4: 16) by *Maritime Stoneworks Inc.*, a stone fabricating facility from the Moncton area. Also of note was the establishment of *Brunswick Limestone*, a company specializing in rough and cut limestone flagstone and related building and landscaping stone from the Hillsborough area of southeastern New Brunswick (Figure 4: 20).

Mineral Aggregate

The production of mineral aggregate from bedrock and granular deposits (sand and gravel) is fairly widespread throughout New Brunswick (Figure 4: 21–27). The resource continued to be developed and utilized for both domestic consumption and export during 2002.

HYDROCARBONS

N.B. Coal Limited, a subsidiary of NB Power, continued production in the Minto–Chipman area (Figure 4: 28). New Brunswick Department of Natural Resources and Energy figures indicate that a total of 181 333 t of coal was mined and 179 631 t of coal was shipped in 2002. The company continues to reclaim land disturbed by its coal mining operations.

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